ON THE STRUCTURE AND FUNCTION OF OUTSOURCING CONTRACTS: AN INTEGRATIVE ANALYSIS OF THE ECONOMICS BEHIND VENDOR-CLIENT RELATIONSHIPS

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Last Revised: February 27, 2002

Abstract: Information technology (IT) outsourcing is an important business consideration and one that is growing. However, there is a lack of understanding about how to construct good IT outsourcing contracts. This work attempts to bridge the gap between theory and practice by elucidating a rigorous mid range theory of IT outsourcing, operationalizing that theory and comparing that operationalization to text from actual IT outsourcing contracts. Doing such makes this the first empirical analysis of incomplete contract theory and the first textual analysis of outsourcing contracts in the information systems literature.

Keywords: Contracts, Outsourcing, Economic Models, Interorganizational Relationships

Acknowledgements: The author would like to thank Allen Lee for his frequent visits and continual promotion of the integrative framework, George John for his valuable comments and insights, and Robert Kauffman and Alina Chircu for the introduction to incomplete contract theory.
INTRODUCTION

Virtually every large firm outsources some part of its information technology (IT) services, and recently midsize and small firms have begun outsourcing. In the US alone, outsourcing accounted for $340 billion in revenue in 2000, a $50 billion increase over 1999 (Outsourcing Institute 2000). Outsourcing of IT services accounts for more than 20% of that figure—almost $100 billion in revenue. While a number of highly publicized announcements seem to have legitimized outsourcing, the true benefits are far from obvious. Many relationships end as failures, incurring huge costs for both partners. Much of this can be attributed to contracting difficulties. Studies indicate that 53% of firms attempt to renegotiate the original terms of the contract with their partners, and ¼ of those renegotiations end in the termination of the relationship (Caldwell 1997). Other estimates show that outsourcing clients spend 15% of their IT budget on litigation (Goodridge 2001).

This illustrates the need for academic researchers to build a better understanding of the outsourcing relationship. Such an understanding will allow practitioners to construct better contracts to mitigate these difficulties. However, such an understanding is difficult to achieve because contracting theories are written by economists, who are very much applied mathematicians, while contracts are written by lawyers, who are very much applied linguists. Thus, to build a testable theory of contracts requires the development of some mid range theory that converts the mathematic theory into textual clauses and vice versa. Luckily, both economists and lawyers undertake their actions for the same purpose, which is to help business managers solve some sort of interorganizational problem. Consequently, by adopting a context researchers can develop mid range theory specific to the problems of that environment in order to bridge the textual documents and the mathematical theory.

This essay undertakes that challenge and in doing so makes three contributions to the comprehension of contracts. First, it develops mid range theory based on the property rights literature (Brynjolfsson 1994, Grossman and Hart 1986, Hart and Moore 1988, Hart and Moore 1990) that allows operationalization of incomplete contract theory. Second, it operationalizes that theory in the context of IT outsourcing addressing problems specific to that environment. Third, it undertakes to evaluate the appropriateness of such theory by examining the text of actual outsourcing contracts. It is important to note that the examination is of the raw text and not some codification of the researcher. This gives the reader the opportunity to draw her own conclusions about the researcher’s explanation. The result is a better understanding of the contract itself and a springboard for further theoretical development by other researchers.

The rest of the paper is organized as follows. The second section presents a review of relevant literature in incomplete contract theory and IT outsourcing theory. The third section presents a formal analytical model of the outsourcing relationship and firm behavior. The data are explained in section four, and then the contractual texts are analyzed in depth in section five. Finally, extensions are proposed and conclusions are drawn in the sixth section.

LITERATURE REVIEW

The importance of interorganizational relationships (IORs) in modern industrial organization has been recognized by a number of disciplines, including economics (Grossman and Hart 1986, Hart and Moore 1990, Kaplan and Strömberg 2000, Lerner and Merges 1998), strategy (Bensaou 1999, Das and Teng 1998, Dyer and Singh 1998), marketing (Achrol 1997, Carson, Devinney,

In looking at IORs, the natural artifact to analyze is the contract (Hui and Beath 2002). Contracts serve as more than simply a list of rules; they define the tone and nature of the relationship. For example, the marriage contract often specifies that each party should “love, honor, and cherish.” This does not define specific actions for specific states, but informs the parties of the nature of the relationship. The contract becomes an exemplary subject for study because it is the written artifact that results from firms trying to understand the nature of the relationship. In this aspect, a contract represents the best example of the shared understanding of the relationship and its potential problems.

A contract is a device designed to solve problems that naturally arise between profit maximizing firms. In order to properly understand a problem-solving device, one requires knowledge of three things: what problem it was designed to solve, why it was designed to solve that problem, and how it solves that problem (Cosmides and Tooby 1997, Marr 1977). A contract is designed to solve incentive problems that exist in the absence of the contract. It is designed to do this because, in the absence of such a solution, firms underinvest in output quality. It does this by modifying the potential payoffs of the value exchange game. The contract gives the parties leverage to enable them to receive a return on their investment that would not be available in the absence of the contract. This gives the parties the proper incentives to invest, and generates greater surplus than would be generated in the absence of a contract. Thus, the a contract is an artifact designed to solve interorganizational relationship problems, and therefore understanding the contract will pave the way for understanding the relationship.

This literature review proceeds by first addressing studies in contracting, which are usually from the economics literature. Then it addresses outsourcing studies, which are in general from the IS literature. In so doing it lays down both the theory and the context for understanding IT outsourcing contracts.

INCOMPLETE CONTRACT THEORY

To study the problems that contracts are designed to solve requires a model of firm behavior in the absence of contracts. The basis for such a model exists in the form of incomplete contract theory (Grossman and Hart 1986). Incomplete contract theory, by definition, specifically models firm behavior in the absence of contracts. To date, the development of the theory has been along two directions; the business literature has pursued the idea that firms should have fewer relationships in order to mitigate incentive problems (Bakos and Brynjolfsson 1993, Bakos and Nault 1997), while in the economics literature, the debate has focused on the reasons contracts may be incomplete (Hart and Moore 1999, Maskin and Tirole 1999, Tirole 1999). I extend the theory in a different direction, by putting forward the incomplete contract model as a model of firm behavior.

The incomplete contract literature began with Grossman and Hart’s seminal work (Grossman and Hart 1986). The purpose of the paper was to build a theory of the firm that explained why the value of asset would depend upon ownership. The basic result is that the firm whose up-front investment is the most important to the creation of joint benefit should own the asset because they, as owners, will invest more in it. The authors use this model to explain why insurance companies own customer lists for certain types of insurance, but agents own customer lists for
other types of insurance. The impetus for incomplete contract theory was the transactions costs literature’s emphasis on the necessity of control in the case of contractual difficulty (Coase 1937, Williamson 1975). Thus, the original paper can be viewed as an attempt to build an analytical model of transactions costs arising from contracting difficulties.

The next logical step was taken by Hart and Moore, who construct the model with \( n \) firms (Hart and Moore 1990). The motivation was to develop a set of proposals about how to allocate ownership among coalitions. It is this aspect of incomplete contract theory that has been most widely applied in the IS literature. Bakos and Nault extend this model, adding a number of propositions about inalienable assets (Bakos and Nault 1997). Bakos and Brynjolfsson (Bakos and Brynjolfsson 1993) use this model to explain why firms may choose to deal with a small number of suppliers rather than a large number. The basic idea is to provide bargaining power to suppliers to insure their investment. This is in contrast to the electronic markets hypothesis of (Malone, et al. 1987), which suggests that IT should reduce transactions costs and lead firms to use a larger number of suppliers. Bakos and Brynjolfsson (Bakos and Brynjolfsson 1993) contend that incomplete contract considerations are more resistant to IT influence than transactions costs. However, ongoing research by Banker et al. (Banker, Kalvenes and Patterson 2000) seems to indicate that IT can lead to more complete contracts. Brynjolfsson (Brynjolfsson 1994) extends the incomplete contract framework to include information assets and derives a variety of propositions about the impact of IT on industrial organization. (Van Alstyne, Brynjolfsson and Madnick 1995) apply incomplete contract theory to database ownership to make the case for distributed databases, proposing that the parties to which the data is most important own the data, and thus will make the greatest investment in the data. The general insight offered in this work is that the parties who are most important to creating value with an asset should own the asset.

The IS literature is largely devoid of research focused on purely contracts. One exception is Whang (Whang 1992) who looks at the structure of software contracts from a game theoretic perspective. Based on a review of several contracts and a number of academic papers, he derives an analytical model of the contracting process for software development. Similarly, Chaudhury et al. (Chaudhury, Nam and Rao 1995) develop an analytical model of contracting as a two stage bidding game, where firms could contract in the earlier period for the first installment of a system, then bid in the second period for the final phase of the project. This allows firms to easily cancel projects that show little promise, without having to breach the contract, and it facilitates optimal bidding. Banker et al. (Banker, et al. 2000) model the impacts of IT on the contracting process. They propose that IT leads to more complete contracting by reducing the cost of writing contracts. Note that though Whang examined five contracts as inspiration for the model, none of this IS research use actual contractual text to evaluate the modeling results. This work fills that research gap by utilizing contractual data to interpret the decision maker’s goals in the contracting procedure.

While the IS literature has used incomplete contract theory to explain the number of suppliers a firm should deal with, the economics literature has primarily addressed the question of how to make contracts complete. In a series of articles in the Review of Economic Studies, Maskin and Tirole debate Hart and Moore on the underlying assumptions of incomplete contract theory. The first article (Maskin and Tirole 1999) points out that one of the underlying assumptions of incomplete contracting is that bounded rationality makes it too difficult to specify all possible contingencies, and thus contracts are necessarily incomplete. However, the paper builds a model, which allows parties to write contracts given that they can probabilistically predict the
future, perform dynamic programming, and commit not to renegotiate. Of course, the probabilistic prediction of the future and the dynamic programming are assumptions always made in the incomplete contract literature, as that is how firms decide their optimal level of investment. The article builds an irrelevance theorem, which shows how firms can write contracts based not on the unforeseeable future states of the world, but on the set of possible payoffs. Thus, it is not important how difficult it is to specify future states.

The reply article (Hart and Moore 1999) points out that it is the fact that parties can not commit to avoid renegotiation that drives the incomplete contract results. The paper develops a model where specifying all possible future states is costless, and yet shows that if parties can not commit to non-renegotiation, the incomplete contract results still hold. The authors describe a number of methods to commit to avoiding renegotiation, and show that each fails. This is consistent with other research that shows that optimal complete contract is often not a realistic option because outcomes are reversible (Krasa and Williams 1999). This means that the results of a certain set of actions can be undone by other possible outcomes, and thus it is difficult to verify the actions were taken. Thus, contracts are necessarily incomplete ex ante, and are renegotiated ex post. For the purposes of this work, there is no need to prove that parties can not commit to non-renegotiation, because we see that the contracts are specifically written to commit to renegotiation.

In a paper similar to this one Kaplan and Strömberg look at the structure of venture capital contracts (Kaplan and Strömberg 2000). They find that these contracts are structured so that if the firm performs badly, the venture capitalist firm is given more control, and if it performs well, the venture capitalist relinquishes most of his control rights, retaining only cash flows from the firm. This accords well with incomplete contract theory because it gives control to the entrepreneur if his investment turns out to be highly important (i.e. the firm he controls does particularly well) and it gives control to the venture capitalist if the entrepreneur’s investment turns out not to generate surplus (i.e. the entrepreneur is a bad manager).

Tirole provides an authoritative overview of the incomplete contracting literature (Tirole 1999). He concludes by noting that complete contract theory may be too readily discounted as an explanation for institutions such as authority and property rights. These institutions can be partially explained in a complete contracting manner by incentive consideration. Tirole also notes some tension between the assumption of rationality, and the inability to describe outcomes, but points out that simpler contracting mechanisms may be only slightly sub-optimal. That is to say that while it is possible to write a complete contract, the advantage over an incomplete contract may not be significant.

One of the champions of empirical tests of incomplete contract theory is Stéphane Saussier. In her early work (Saussier 1998) she empirically compared transactions costs theory to incomplete contract theory. The basic insight of this work is that the function of contracts in the transactions cost framework is to provide safeguards for specific assets in future periods, while the incomplete contract framework views contracts as a method of providing parties the incentive to invest.

Continuing work (Bréchemier and Saussier 1999) provided a better operationalization of investment importance, and found that incomplete contract considerations were quite important. This operationalization was based on sourcing contracts for airline ground services such as reception, luggage check, and plane defrosting. Investment importance was determined by survey response where the question related to the impact of a variation of vendor quality variation on customer satisfaction. The impact of this variable was significant and greater in
absolute value than either frequency of transaction or asset specificity, leading the authors to conclude that incomplete contract theory should be treated as a complementary approach to transaction costs theory.

The goal here is not to debate the assumptions of incompleteness, but to apply the ideas of the theory to explain why outsourcing contracts are written as they are. Likewise, while the focus of incomplete contract theory to date has been on the allocation of property rights, I expand the frontiers of the model. Specifically, I recognize that property rights are simply a specific example of the general goal of contracts, which is to provide assurances to each party. My use of the incomplete contracting model is not focused on property rights, but on the behavioral assumptions implicit in the model.

OUTSOURCING THEORY

Academic interest in outsourcing bloomed with (Loh and Venkatraman 1992) examination of the Kodak Effect. The authors suggest that while outsourcing was taking place in the 1980’s the event that legitimized it was Kodak’s 1989 announcement that it was outsourcing its data center to IBM. While the thesis of the paper—that IT outsourcing increased greatly after the announcement—was later questioned (Hu, et al. 1997), the paper itself still marks the beginning of the academic interest in outsourcing. The primary stewards of this research have been Lacity and colleges, who have applied a case study method to understanding what makes outsourcing successful.

In the 1993 book (Lacity and Hirschheim 1993) the authors perform several case studies based on interviews with managers at multiple firms. They find that the outsourcing relationship is motivated both by political factors and by transaction cost factors. The point to the contract as a particularly important part of the relationship, going so far as to suggest that it is the only protection clients had against an opportunistic vendor. A follow up book (Lacity and Hirschheim 1995) examines IT insourcing, and finds that firm IT departments are often very capable of delivering IT services on par with a vendor when given the incentive and ability to competitively bid. This raises the question about the source of value created by vendors. Further work (Willcocks, Lacity and Kern 1999) looks at a single relation over time and shows that risk sharing is an important part of the outsourcing relationship.

Lacity and Willcocks look at data from 61 outsourcing agreements between 1991-1995, to identify five best practices (Lacity and Willcocks 1998). They find that selective outsourcing more frequently resulted in cost savings than total outsourcing, presumably because few vendor firms have talents in all areas of outsourcing. Outsourcing agreements that were made with the joint sponsorship of senior executives and IT managers were more successful at achieving cost savings than agreements sponsored only by senior executives or IT managers. Soliciting both internal and external bids led to more frequent cost savings than simply comparing bids to current costs, or to no bid process at all. Thus, by opening new choices to the internal IS department firms were able to cut costs. Short term contracts were found to achieve more frequent cost savings than longer term contracts. This is attributed to an uncertainty reduction. Longer term contracts are more uncertain by nature and while costs are bounded below, they are not bounded above. Hence it is more likely with a long term contract that a catastrophic event will occur (e.g. year 2000 problems). Further, it is more likely that a long term contract will improperly specify important factors, such a fixed prices, and lead to inappropriate actions and incentive incompatibility. The final finding of the paper was that a more specifically detailed
contract achieved its cost savings goals more often than looser contracts, partially because more knowledgeable firms with more accurate expectations wrote the more detailed contracts.

More recently, researchers at the University of Pennsylvania have investigated contractual relationships in a variety of ways. Snir and Hitt (Snir and Hitt 2000) suggest that outsourcing contracts are largely incomplete because the outcomes are not verifiable to a court. They propose the use of a pilot project as a method of screening vendors. The idea is that by establishing a pilot project with a very small payoff, and a full project with a very large payoff, only the vendors of high quality will be willing to perform the pilot project because they can recoup their losses in the full project. Low quality vendors, on the other hand, will not perform the pilot project because their poor quality will be evident and they will never be awarded the large project.

Clemons and Hitt (Clemons and Hitt 2000) observe another problem specific to information intensive relationships. Because ownership, in the traditional sense, cannot be assigned to information it is possible for partners to misappropriate the information for use outside the relationship. They term this poaching, and it occurs because unlike a physical asset, an information asset is not consumed in use and it cannot be returned upon conclusion of the contractual relationship. Thus, when a client gives vendor access to its proprietary information, it has forever lost sole ownership of that information. The authors illustrate with the example of Priceline.com, who formed a number of relationships early in its existence and now sees its former partners as competitors using similar technology based on the information Priceline.com shared.

While these case studies do a good job of explaining the outsourcing relationships, and offer considerable insight, they do not formally model the contracting process. Similarly, the modeling papers, while offering rigorous understanding of outsourcing, do not empirically evaluative the propositions. Thus, this work fills a void in the outsourcing literature by both empirically evaluating actual contracts and explicitly modeling the contracting process that leads to the basic of the relationship, as follows.

MODEL

TIME FRAME OF THE MODEL

The model must explain firm behavior based on a few, reasonable, primitive assumptions. Incomplete contract models typically distinguish two periods. However, decomposing the model into more time periods facilitates greater understanding of the process. For example, in their later work, Hart and Moore break the process into three periods—contracting, investing, and negotiation (Hart and Moore 1999). I build upon this concept, explicating on additional period for clarity, so the resultant model is expressed in four periods (see Figure 1).
In the first period, organizations are exogenously linked so that one firm’s outcomes in period four depend upon the other firm’s actions in period three. This means, simply, that the potential joint surplus is greater than the sum of the individual surpluses, hence it might make sense to consider forming a relationship. To illustrate, consider the Kodak outsourcing agreement. At some time Kodak, IBM and the state of technology developed to a point where the actions of Kodak effected IBM’s outcomes and the actions of IBM effected Kodak’s outcomes. This occurred before there was any outsourcing agreement, before any contract was signed and even before negotiations begun. In this stage, the potential for a relationship comes into existence. This is not to say that a relationship will be formed, because, for example, Kodak’s actions effect CSC’s outcomes¹ and yet there is no relationship between the two. The source of this potential remains somewhat obscure, but explanations include economies of scale (Lacity and Hirschheim 1993), access to information (Walden 2001), and specialization.

In the second period, firms are able to negotiate a contract. The contribution of this research derives, in part, from the recognition that there already exists a linkage between each firm’s actions and the other firm’s outcomes before they begin to negotiate the contract. The linkage between the firms guarantees that they have some value in period four, which they will bargain over. Thus, at the beginning of period two the firms have a wholly incomplete contract, which will impose problems as discussed in the next subsection. At the end of period two the firms will have created a contract to address those problems.

In the third period, each firm makes investments which impact the other firm’s outcomes. The more a firm invests the greater the joint surplus. There exists some optimal level of investment for each firm that maximizes the joint surplus. This is the level of investment where the marginal return to joint surplus is equal to the marginal cost to the firm of making the investment. The incomplete contracting problem is that firms make investments to maximize their individual surplus. As a result, they invest up to the point where marginal cost equals marginal individual benefit, which, because firms must share the surplus, is less than the joint surplus.

In the fourth period firms bargain over the surplus, subject to the terms of the contract negotiated in the second period. This does not imply that the firms do what the contract specifies, but rather that the firms’ bargaining position depends on the contract. Thus, this paper adopts Crocker and Masten’s view that “contracts do not so much define the terms of trade as establish the procedures and alter the threat points from which parties compete over the division of transactional surpluses (Crocker and Masten 1991 p 70).” All contracts are renegotiable

¹ Namely, if Kodak decides to outsource with CSC rather than IBM, so value is generated for CSC.
because courts will only enforce contracts if one of the parties chooses to litigate, which will not
be the case if the renegotiation is better for all parties. For example, if two firms sign a contract
that specifies the vendor must deliver a widget to a client for a price of $100, that does not mean
that the widget will be delivered for $100. If, for example, the client has no use for a widget at
the appointed time it may offer the vendor $80 to buy out of the contract. The vendor will
readily agree if it can sell the widget to some outside entity for more than $20. A new contract
would be negotiated to supersede the prior contract, and neither the widget nor the $100 is
delivered as stipulated in the original contract. As mentioned in the introduction, renegotiation
is the rule rather than the exception in IT outsourcing as 53% of firms renegotiate the original
terms of the contract with their partners (Caldwell 1997). Note that while the contract is not
executed, it does have an impact on outcomes. In the absence of a contract the client would
simply not offer to purchase the widget and the vendor would have to go to the outside entity.
The payoff to the vendor would be $20 instead of $100 and the payoff to the client would be $0
rather than -$80. Thus, the contract has significant impact on the outcomes even if it is not
actually invoked.

ANALYTICAL MODEL

The incomplete contract model of Grossman and Hart (Grossman and Hart 1986) provides an
excellent model of firm behavior in the absence of exogenously imposed outcomes. This model
assumes that firms maximize their own profit without concern for the profits of other firms.
Each firm’s cooperation is necessary to generate a joint surplus greater than can be individually
generated. Firms make investments that increase the joint surplus, and they engage in Nash
bargaining to divide this surplus. Thus, the incomplete contract model offers a rich descriptive
model of firm behavior in the absence of contractual safeguards. This paper builds on the
behavioral model implicit in Grossman and Hart. For this exposition the firms are termed client
and vendor.

In game theoretical work it is typical to begin with the last period and work backward solving
the game deductively. In the forth period the client chooses a set of actions \( q_c \) and the vendor
chooses a set of actions \( q_v \). These actions jointly determine functions \( \phi_c \) and \( \phi_v \). In the third
period, the parties make investments \( a_c \) and \( a_v \) in the relationship. The benefit to each firm is
\( B_i \), a function of period four actions and period three investments. This can be written as:

\[
B_i(a_i, \phi_i(q_c, q_v))
\]  

(1)

In this model, two firms, vendor and client, engage in a relationship. Each receives its own
benefit \( B \), which is a function of its own ex ante investment \( a \), and the ex post actions \( q \) of both
firms, which are conditional on the terms of the contract negotiated in period two. For example,
the \( q \)'s might be choices of different architectures, while the \( a \)'s would be the investment in
learning about a particular architecture. This yields two benefit functions, where the benefit to
the client is greater than the cost (negative benefit) to the vendor. The difference, or gain to
trade, is satisfied by a payment \( p \) in the second period from the client to the vendor\(^3\). Thus, the
total value to each firm is described by the equations

\( ^2 \) Bold text denotes a vector valued variable.

\( ^3 \) In essence, one firm sells the other firm the right to behave opportunistically. This is especially relevant in the IT
outsourcing context because vendors actually pay the clients up front for the future stream of business. In some
\begin{align*}
Value_{\text{client}} &= B_c(a_c, \varphi_c(q_c, q_v)) - p \tag{2} \\
Value_{\text{vendor}} &= B_v(a_v, \varphi_v(q_c, q_v)) + p \tag{3}
\end{align*}

In this setting, a contract can influence behavior in four ways as illustrated in Table 1. A contract is basically a specification of the rules of the game. In the incomplete contract sense the contract describes the form of the second period game \( \varphi(q_c, q_v) \). The \( q \)'s are simply vectors of strategies or choices. For example, one of the \( q \)'s might be the choice of IT infrastructure. In such a case, \( q_{c,\text{INF}} \) could be a strategy chosen from the set \{\text{Mainframe, Client-Server}\}, as could be \( q_{v,\text{INF}} \) (See Table 1). The contract would specify the payoffs to these different strategy combinations in three ways—specification of actions, ownership, and transfers.

cases, vendors go so far as to make low interest loans to the clients in order to secure their business (1995). Hitt and Snir (2000) propose pilot projects as a way to mitigate this problem.
Table 1: How contracts can specify payoffs

<table>
<thead>
<tr>
<th>ABSOLUTE INCOMPLETENESS</th>
<th>Vendor’s Strategy</th>
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<tbody>
<tr>
<td>(Client’s payoff is first)</td>
<td>(q_v, INF)</td>
</tr>
<tr>
<td>Client’s Strategy (q_c, INF)</td>
<td></td>
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<tr>
<td>Mainframe C/S</td>
<td>(1, 2)</td>
</tr>
<tr>
<td>(Client’s payoff is first)</td>
<td>(q_v, INF)</td>
</tr>
<tr>
<td>Client’s Strategy (q_c, INF)</td>
<td></td>
</tr>
<tr>
<td>Mainframe C/S</td>
<td>(0, 4)</td>
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</tbody>
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<tr>
<th>COMPLETE CONTRACT</th>
</tr>
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<tbody>
<tr>
<td>(SPECIFIED q)</td>
</tr>
<tr>
<td>Vendor and Client must play q_v, INF = C/S</td>
</tr>
<tr>
<td>(Client’s payoff is first)</td>
</tr>
<tr>
<td>Client’s Strategy (q_c, INF)</td>
</tr>
<tr>
<td>Mainframe C/S</td>
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</tbody>
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<table>
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<tr>
<th>OWNERSHIP</th>
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<tbody>
<tr>
<td>Client owns q_c, INF and q_v, INF</td>
</tr>
<tr>
<td>(Client’s payoff is first)</td>
</tr>
<tr>
<td>Client’s Strategy (q_c, INF)</td>
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<td>Mainframe C/S</td>
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<tr>
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<tr>
<th>TRANSFER</th>
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<tr>
<td>Vendor must pay client 1 if C/S is chosen</td>
</tr>
<tr>
<td>(Client’s payoff is first)</td>
</tr>
<tr>
<td>Client’s Strategy (q_c, INF)</td>
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<tr>
<td>Mainframe C/S</td>
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<tr>
<td>(Client’s payoff is first)</td>
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<tr>
<td>Client’s Strategy (q_c, INF)</td>
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<td>Mainframe C/S</td>
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**Interpretation:** The game represents a choice between two different IT infrastructures, mainframe on client-server (C/S). The joint surplus maximizing choice is for both firms to choose the client-server infrastructure. However, each can make itself unilaterally better off by choosing the mainframe structure. The vendor, for example, can guarantee a payment of at least 2 by choosing mainframe, while the client can guarantee a payment of at least 1 by choosing mainframe. Firms will negotiate to the joint surplus maximizing cell. In the absolute incompleteness case the vendor will receive a negotiated payoff of 3½ (½[3+3-2-1]+2) and the client will receive 2½ (½[3+3-2-1]+1). In the client ownership case the vendor would receive a payoff of 1 (½[3+3-4-0]+0) and the client would receive a payoff of 5 (½[3+3-4-0]+4). In this case the vendor offers the client a payment of 2 in order to induce the client to switch from the mainframe strategy, which offers him a unilateral payoff of 4, to the client-server strategy, which offers him a unilateral payoff of 3. In the transfer situation the client must pay the vendor 1 if the final state is such that the client chooses mainframe. In this case the vendor will receive a negotiated payoff of 4½ (½[3+3-3-0]+3) and the client will receive 1½ (½[3+3-3-0]+0). As these payoffs change, so do the incentives to invest.

The first case is the null case, or the case of absolute incompleteness. This case represents no contract at all on a certain set of the states of the world. This of course influences behavior, because it introduces the incomplete contracting problems described in the literature. However, incompleteness does not always lead to sub-optimal outcomes (Hart and Moore 1999). A simple example illustrates. If the q’s are such that each has only one reasonable choice, then the firms’ non-cooperative outcome is equal to its cooperative outcome and each gets all of its own investment. This helps explain why there are not clauses in contracts that specify that the vendor will not set the mainframe on fire. This is not a credible threat for the vendor to make, and the client will not react to it. In fact it is in the best interest of both firms if the vendor does not set the mainframe on fire, thus it does not need to be explicitly forbidden, and contracts are incomplete on the point of whether or not the vendor may set the mainframe alight. Thus, researchers would expect to see incompleteness in situations where firms’ incentives are
aligned. This is an important point in the study of contracts. Outsourcing contracts should have a tendency to be more complete because the incentives of the two firms are naturally in opposition as each can unilaterally improve their position by shirking.

The second way contracts can influence behavior is by specifying the $q$'s. This is the typical conceptualization of a complete contract as a device to specify actions of parties in various states of the world. It is important to reiterate the idea that specifying actions does not mean that those actions will necessarily be taken. However, specifying the actions will modify the payoffs thereby changing the behavior of the firms. Further, if the actions are correctly specified, in the sense that they are joint profit maximizing, then there will be no incentive to renegotiate. Thus, specifying the actions is generally seen as an optimal solution, and economists argue over which actions can be specified.

A third way in which contracts can offer assurances is by specifying ownership of an asset, which means that the owner gets to choose all of the actions relevant to a certain asset. The Grossman-Hart model specifies the form of the game by defining control of strategies $q$. Assets in the Grossman-Hart model have an associated vector of $q$'s that describe actions enabled by the asset. Incompleteness arises when some of the $q$'s are not specified. These non-contracted $q$'s are residual rights of control, and “(o)wnership is the purchase of these residual rights of control (Grossman and Hart 1986, p. 692)”.

A complete contract specifies control of each $q$ individually, while an incomplete contract specifies groups of $q$'s via ownership. Continuing the operating system example a contract could specify that the client have the right to choose the value of both $q_{c,\text{INF}}$ and $q_{v,\text{INF}}$.

These three methods have important implications for the structure of contracts. For a given asset, if it is primarily a large number of minor details that make the asset productive, then rather than specify each detail, a contract would tend to assign ownership of that asset. However, if a few significant actions make an asset productive, but most of the details are minimally important, then the contract would tend to specify the actions to be taken with the asset. Moreover, ownership should go to the party who has the most impact on the details, while the contract should specify the important actions. In other words, if there are both non-contractible $q$’s and contractible $q$’s, then ownership should go to the party that has the most impact on the non-contractibles, with the contract specifying the contractible $q$’s. For example, a contract may specify ownership of mainframe going to the vendor, but include a clause specifying what software may be run on that mainframe.

The forth way that a contract can offer assurances is by specifying the form of $\varphi_i$, which simply means that it specifies the payoffs to the strategies. This can be accomplished by specifying a transfer from one party to another dependent upon the final realized state of the world. This type of assurance is a contract against outcomes rather than against actions. This sort of contract is the point of Maskin and Tirole, who suggest that firms do not particularly care about the actions of other firms, only the outcomes of those actions (Maskin and Tirole 1999).

Basically, a transfer would be in the form of an if-then statement, specifying that if the game ended up in a certain cell, something would be done to change the payoff of that cell. This may be a payment from one party to another, or it may specify movement to another cell. The end result is to change the payoff structure of the game, without assigning control of $q$’s.

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4 To be more correct, researchers would expect to fail to observe contractual safeguards for actions where firms’ incentives are aligned.
When might an assurance be a good solution? An assurance would be a good solution if there was a particularly important outcome that the parties wanted to insure. In particular assurances would be important when one party’s non-cooperative payoff was particularly dependent on the other party’s non-contractible actions. This leads to a proposition.

**Proposition 1:** The more dependent Firm A’s payoffs on Firm B’s non-contractible actions, the more valuable it is for Firm B to provide Firm A an assurance on outcomes.

Because ownership by one firm, makes the other firm’s outcomes completely dependent on the owning firm, another proposition follows.

**Proposition 2:** When ownership is assigned to a Firm A, it will be more valuable for Firm A to assign assurances to Firm B than it would be if Firm B owned the assets.

To recap, there are three ways in which a contract can specify the form of the second period game \( \phi_i(q_c, q_v) \). First, it can specify individual \( q \)'s, which is what a complete contract does (i.e. specifying individual actions). Second, it can specify control of all \( q \)'s of an asset through ownership. This is the Grossman-Hart contribution. Finally, it can specify the actual payoffs of the game (i.e. the functional form of \( \phi \)), through transfers. Thus, the contract negotiation is simply a negotiation over a mutually agreeable set of games \( \phi_i(q_c, q_v) \) and \( \phi\). These games are more complicated than the ones shown above in a number of respects. There are considerably more decision variables, each of which may have more than two possible strategies.

Ownership, is a very high powered method of encouraging investment. However, it may be too heavy handed, in that it distorts incentives for the non-owning firm to invest (Grossman and Hart 1986). The beauty of the model as expressed is that it makes no assumptions about what methods can be used to change parameters. Incomplete contract theory posits that whoever’s invest is most important to an asset, should own that asset. Unless only one firm’s investment is important, it is theoretically possible to increase joint benefit beyond the ownership optimal through some other method of modifying the game. Of course, the methods of any one contract would be specific to the relationship in question. Because of this, it is intractable to explain all of the specific contract clauses. What can be explained is what sorts of clauses are in contracts and what sorts should be in contracts.

The important point is that ownership is only one way of moving the non-cooperative outcome closer to the cooperative outcome, and thereby globally optimizing ex ante investment. There may be other ways to achieve this goal, and contracts should reflect this. If outsourcing contracts are an artifact reflecting the firms’ cumulative knowledge and expertise, it is possible to test incomplete contract theory through an examination of the types of protections written into them. Further, such an examination should yield insights into the types of protections that are effective in encouraging investment, so that firms may better structure future contracts.

**DATA**

The data for this study comes from the examination of three outsourcing contracts from a major IT outsourcing firm. The vendor ranks among the top five outsourcing firms, with revenues in the billions of dollars. Examination of contracts from such a large and well established firm provides a number of benefits. Presumably, the vendor became so large by offering some sort of real value proposition to its clients. Whether this value came from reduced
costs, increased quality, or access to unique skills, the vendor has demonstrated an ability to influence client’s outcomes. Further, by virtue of the size of its client base, this firm has extensive contracting experience, placing it further along the learning curve for designing effective contracts. In addition, this firm has a significant reputation to uphold, giving it an incentive to not take unfair advantage of client ignorance. Thus, this firm has the ability to write good contracts, the ability to generate profit by offering a real value proposition, and the incentive to treat clients fairly. While this will not guarantee perfect contracts, it will likely produce some of the best outsourcing contracts available for study.

The first contract is an agreement to provide IT services to a steel manufacturer (hereafter STEEL). STEEL is a fortune 500 company with revenue in the billions and over 10,000 employees. The contract is a 10-year agreement begun in 1993. The vendor is to provide management services for STEEL’s applications development, systems integration, user support network, voice and data communications network operations, client server implementation and multi-vendor data center operations. At the time of the contract, STEEL was managing its own data center. This could be considered a textbook example of outsourcing.

The second contract is an agreement with a retail department store (hereafter RETAIL). Retail operates hundreds of stores in a multiple states, and has revenues in the billions. This is a $100 million contract, signed in 1999, for data center management and hardware support for virtually all of RETAIL’s systems including point of sale systems. Again, at the time of the contract RETAIL was managing its own IT infrastructure, and this represents another classic example of outsourcing.

The final contract is a partnership with a telecommunications company (hereafter TELECOM). TELECOM has revenues in the tens of billions and many tens of thousands of employees. The contract is a 10-year agreement with a yearly charge cap at $200 million. The contract, signed in 1996, hints at a deeper relation than the arms length purchase of services. The vendor has primary responsibility for managing the data center, help desk, and disaster recovery. However, it still has the flavor of a typical outsourcing arrangement. This is because in the telecommunications industry the performance of the information technology is the key driver of output. Thus, the telecom company needs a closer relation with the outsourcer. At the same time, they are focusing on outsourcing some of the non-telecom aspects of the business so the urgency is not as great. Each of these was formerly managed by TELECOM. This contract is much more of a partnership than the other two, with each firm expected to contribute to revenue generation.

In sum these three contracts provide a very nice sample of outsourcing as it is typically conceptualized. One large firm chooses to purchase data center services from another large, reputable firm. The contracts’ values are in the hundreds of millions for either five or ten years. The vendor takes over an already existing department, purchases the hardware, assumes the leases on the software, and hires the employees of the client firm. This contracts range across the 1990’s, so they represent contracts signed in a time when outsourcing was acceptable, and economic conditions were favorable. In all, these contracts represent outsourcing without anything fancy, and provide an exceptional base from which to analyze the standard outsourcing relationship.
EXAMINATION OF CONTRACTS

INTEGRATIVE FRAMEWORK

An interpretive approach lends itself to the study and understanding of qualitative data embodied in textual documents, in general, and to contracts in particular. Prior work using contracts to understand relationships concentrated on the quantitative aspects of the contract, such as the presence or absence of a clause (Adler, Scherer, Barton and Katerberg 1998, Saussier 1998) or analytical models (Banker, et al. 2000, Chaudhury, et al. 1995, Whang 1992). Consistent with the relationship as the unit of analysis, this work focuses on the entire contract as the unit of observation. Thus, it is necessary to scrutinize the text of the contract to interpret the intentions of the writers of the contract. This allows the researcher to build a better understanding of the entirety of the relationship by giving it context. Such an interpretive approach serves as a complement to positivist approaches, allowing scholarly understanding to expand its previous bounds (Lee 1991). In order to take full advantage of the information in this complementarity, I adopt the integrative framework of Lee (Lee 1994). This framework encourages the researcher to develop and test theory using three types of understanding: the interpretive, positivist, and subjective.

The examination of the textual clause of the contracts proceeds as follows. First, the general model is detailed and a mid range theory elucidated. This has been done in the previous sections and points toward three contractual artifacts to seek—absolute incompleteness, ownership and transfers. The work does not search for the forth contractual artifact—complete contracting—because the purpose is to explain the incomplete parts of the contract. Given these three contractual artifacts, the researcher then scrutinizes the contracts for important contextual aspects. In other words, the researcher looks for problems specific to the IT outsourcing context. The problem is then addressed by some sort of contractual artifact and the researcher explains how that artifact provides a reasonable solution to the problem using the theory. This illustrates the contracts writer’s subjective understanding through a strong positivistic theory via the researcher’s understanding of both the theory and the context. The goal then is for the researcher to present to the reader an explanation of how a certain textual passage is consistent with the theory, thereby substantiating the theory and generating richer understanding from which to expand the theory.

ABSOLUTE INCOMPLETENESS OF CAPITAL DISPOSAL IT OUTSOURCING CONTRACTS

As incompleteness indicates something missing, one would not expect to find examples of contractual incompleteness actually written into contracts. However, the contracts contain exactly this sort of clause. Each contract has a clause similar to the following:

Client may request to purchase and Vendor at its discretion, may consider to sell the Vendor-owned machines then currently being used by Vendor on a dedicated basis to perform Services at a fair market value…

Clearly, the clause does not add anything to the contract, because in the absence of a contract the client certainly has the right to request to purchase not only machines being used to provide service to the client, but any machines or other capital owned by the vendor. Similarly, the vendor certainly has the right to sell these machines at its discretion. While this clause performs
no function for either firm, it does allow a researcher to glimpse the though process of the
writers. The writers were thinking in terms of incompleteness. They realized that they did not
know if it would make sense for the client to buy the machines, but wanted to keep that option
open. At the same time they did not know if it would be a good idea for the vendor to sell the
machines, so they wanted to keep that option open too. The solution was to explicitly model the
incompleteness in the contract. In fact, this clause may make the contract more incomplete than
it would be in the absence of any clause. In the absence of any clause, the buyback price would
be settled based on past precedent for similar cases. Thus, the purpose of this clause might be to
specify absolute incompleteness in order to maximize future flexibility.

OWNERSHIP OF PERSONNEL IN IT OUTSOURCING CONTRACTS

Arguably, the manager in charge of the outsourcing function is the single most important
issue involved in an outsourcing contract (Lacity and Willcocks 1998). If the person in charge
lacks the technical skills, the managerial ability, or the motivation to build a quality IT
department, then the relationship will fail. Thus, it is not surprising that outsourcing contracts
provide for specification of this individual’s employment conditions. The vendor firm will have
ownership of the IT director, so it is not surprising that contracts stipulate some assurances for
the client firm relative to the IT director. For example, the STEEL contract specifies.

Vendor will designate … [a] Project Executive to whom all Client communications may be
addressed and who has the authority to act for and bind Vendor and all of its subcontractors in
connection with all aspects of this Agreement.

Vendor will give Client at least 30 days advance notice of a change of the Project Executive
and will discuss with client any objections Client may have to such changes.

In the event that Client reasonably and in good faith determines that it is not in the best
interests of Client for any Vendor employee or subcontractor to continue performing any of the
Services, then Client shall give Vendor notice specifying the reasons for its position and
requesting that the employee or subcontractor be replaced. Promptly after its receipt of such
notice, Vendor shall investigate the matters stated in such notice and, … shall replace such
employee or subcontractor with a person of suitable ability and qualifications

The writers of the contract have specified a way to encourage investment on behalf of both
the vendor and the client. The vendor owns the Project Executive, thus they posses the proper
incentives to cause them to make investments in building the human capital of the Project
Executive. Because the Project Executive works for the vendor, they can transfer him to other
clients where his talents create the greatest benefit. The majority of surplus generated through
vendor investment in the Project Executive is appropriable by the vendor because of their
employment of the Project Executive. Presumably, the vendor’s investment in the Project
Executive is more important for generating surplus than the client’s. If the client had the ability
to train a world class project manager, they would not be likely to gain much benefit from
outsourcing.

Notice that the contractual clauses as written are not entirely enforceable. Specifically, the
requirement of 30 days advance notice may not be enforceable. Taken literally, if the Project
Executive were to die, the contract would require the vendor to raise him from the dead, so that
he could work for at least 30 more days. More realistically, the Project Executive is a free
human being rather than a slave, and can quit working for the vendor at any time. Thus, the
contract does not actually require 30 days notice, rather it assures the client the value of 30 days
labor. For example, if the Project Executive had some special talent for which another client would pay a great deal, the vendor would be able to move him immediately by offering the client firm a payment that at least compensated them for the 30 days labor.

Thus, the 30 days notice, does not insure that the client firm will be given 30 days notice, rather it offers an assurance that changes the game the vendor and client play, so that the client’s payoff is greater by 30 days.

This can be illustrated mathematically by continuing the game example from above. The specified benefits are given holding first period investment, \( a \), fixed. The overall benefit should be a function of \( a \) so that the form of the game looks like the game in Table 2 below.

<table>
<thead>
<tr>
<th>Table 2: Benefits As A Function Of Investments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vendor’s Strategy</strong> (( q_v, q_H ))</td>
</tr>
<tr>
<td><strong>Mainframe</strong></td>
</tr>
<tr>
<td>((a_c, 2a_v))</td>
</tr>
<tr>
<td>((0, 4a_v))</td>
</tr>
</tbody>
</table>

The Nash bargaining solution under the incomplete contract is \( \frac{1}{2} \) of the additional surplus generated through cooperation plus the value of non-cooperative outcome. This benefit, from the client’s point of view is:

\[
\frac{1}{2}(3a_c + 3a_v - a_c - 2a_v) + a_c. 
\] (4)

The client will choose a level of investment \( a_c \) to maximize (4) that satisfies the first order condition:

\[
\frac{c}{\partial a_c} [\frac{1}{2}(3a_c + 3a_v - a_c - 2a_v) + a_c] = MC \Rightarrow MC = 2a_c, \] (5)

where MC is the marginal cost which is an increasing function of \( a_c \).

If the incomplete contract is replaced by one that insures the client of 30 days worth of value from their investments on the Project Executive then the benefit becomes

\[
\frac{1}{2}(3a_c + 3a_v - (1 + \zeta)a_c - 2a_v) + (1 + \zeta)a_c, \] (6)

where \( \zeta \) is the value of the 30 days additional labor. This results in a first order, profit maximizing condition of:

\[
(2 + \frac{1}{2}\zeta)a_c = MC, \] (7)

which results in strictly greater investment than (5) under standard assumptions.

The lesson inherent in this analysis is that the offer of an assurance encourages investment. Of course, this investment comes at the expense of investment by the vendor (who must subtract \( \zeta \) from his payouts). In all likelihood, giving up a bit of marginal investment on behalf of the vendor, will be more than compensated by the addition of the basic investments on behalf of the client.

A more profound piece of evidence presents itself in the examination of the contractual statements. It is clear that there could be value added by investing in improving the human capital of the Project Executive, but there is another way that value can be generated by moving the Project Executive. If the Project Executive performs so poorly that it is more valuable to have nobody doing the job than it is to have him doing the job, then surplus can be generated by
moving him. Obviously the client has no incentive to invest in degrading the performance of the Project Manager, but the vendor might have such an incentive\(^5\). The potential for this sort of negative investment to generate surplus for the vendor explains why the contract allows the client to remove the Project Executive without notice.

The Project Executive clause indicates that firms are cognizant of the problems of underinvestment and negative investment that would be inherent if there were no contractual assurances. This clause provides support for the idea that firms behave as incomplete contract theory suggests, and that the contract writers are aware of this behavior and the resultant problems. The writers realize that by specifying a 30 day warning, they can change the threat points for the client to encourage greater investment in the Project Executive’s human capital. At the same time, the writers are aware that the vendor’s investment in the Project Executive’s human capital is the most important, and thus the contract allows the vendor to employ and to move the Project Executive.

Incomplete contract theory also predicts that the more important a firm’s investment in an asset is at generating surplus, the more important it is for them to own the resource in question. A perfect illustration of this occurs in the RETAIL contract. One clause specified by this contract that was not present in STEEL contract relates to turnover rates as follows.

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Client and Vendor both agree that it is in their best interests to keep the turnover rate of the Vendor personnel performing the Services at a reasonably low level. Accordingly, if Client reasonably determines that the turnover rate of the Vendor personnel performing the Services is excessive and so notifies Vendor, Vendor will meet with Client to discuss the reasons for the turnover rate, and Vendor shall submit to Client its proposal for reducing the turnover rate and the Parties shall mutually agree on a program to bring the turnover rate down to a reasonably acceptable level.

Thus, the RETAIL firm sees investment in employees as part of its differentiation strategy. If RETAIL has no intention of investing in the vendors employees then it has no concern about the turnover rate, because there is noting for it to lose with turnover. The service levels and prices are fixed, so the only loss from turnover is the investments in human capital. Thus, by strategic design the human capital investments of the client in the vendor employees are important. Nowhere, should they be more important than in the investments in the Project Executive, and in this contract, the Project Executive clause is somewhat different than in the previous contract.

Vendor will give Client at least 60-days notice prior to assigning a new Vendor Project Executive, unless Client consents to such assignment or the Vendor Project Executive: (1) Voluntarily resigns from Vendor; (2) is dismissed by Vendor for misconduct (e.g. fraud, drug abuse, theft); (3) fails, in Vendor’s sole and absolute discretion, to perform his or her duties and responsibilities pursuant to this Agreement; or (4) is unable to work.

Because the client’s investment in the human capital of the Project Executive is more important in this contract, the vendor gave the client twice the ownership in the work of the individual (60 days rather than 30 days). However, to partially mitigate the loss of ownership,

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\(^5\) The practice of greenmail illustrates this sort of negative investment. A greenmailer makes profit by purchasing enough of a publicly traded company to garner a seat on the board of directors. They then use their influence to degrade firm performance until the other shareholders buy them out at a higher price in order to regain control of the firm.
the vendor specified a number of assurances to guarantee they would not lose additional amounts if they had to remove the Project executive for good reason.

This idea is illustrated more vividly in the TELECOM contract. This contract sets up an alliance between the vendor and the TELECOM company. In an alliance, the investments of both parties are expected to be important. This requires both parties to have partial ownership in order to encourage investment. Thus, it should be the case that even more ownership of the Project Executive is assigned to the client. In fact, not only does the contract specify treatment of the Project Executive, but it specifies special treatment for a number of Key Persons.

Vendor will give Client at least 30 days’ advance notice of a change of a Key Person. Barring circumstances beyond its control or a material failure by such a Key Person to perform his or her material responsibilities, Vendor shall not replay a Key Person without Client’s prior consent until such a Key Person has served on the project provided for in this agreement for at least eighteen (18) months.

It becomes clear that the firms are anticipating the investment problems and taking to appropriate actions to mitigate those problems. The vendor is assigned ownership of the human capital dedicated to providing services, but some level of client investment is necessary, so the vendor reassigns some of the ownership back to the client, thereby assuring them of some fraction of the return on their investments. The more important the client investment in the human capital, the more ownership is given over from the vendor to the client.

**OWNERSHIP OF SOFTWARE AS A UNIQUE ASSET IN IT OUTSOURCING CONTRACTS**

Understandably, software is one of the predominate features discussed in outsourcing contracts. Upgrading, modifying and customizing software to fit in with the specific needs of the business are some of the major tasks required of an outsourcing vendor. Investments in high quality code are a paramount goal of these contracts, indicating that the vendor firm should own the software assets. However, customizing by its very nature requires the involvement of the client, because it is for the client’s specific idiosyncratic nature that the software is being customized. Thus, the client’s investment in the process equally important in the development of quality code. Therefore the client should own the software. Interestingly, the unique characteristics of software as a digital good allow for both firms to maintain ownership. Consider what STEEL has to say about intellectual property rights surrounding developed software.

...Vendor will grant to Client the following license rights … at the expiration or earlier termination of this Agreement, so long as Vendor has fully complied with all of its obligations and is not in default under this Agreement: 1) an irrevocable, nonexclusive, worldwide, paid-up license to use, execute, reproduce, display, perform and distribute the Materials internally and for the sole benefit of and exclusive use by Client; and 2) the right to sublicense third parties to do any of the forgoing.

This is a magnificent solution to giving assurances without damaging incentives. To appreciate this, note that the vendor maintains full ownership of the software. The value of the software to the vendor arises from the vendor’s ability to sell it to other clients. Ownership, of course, gives the vendor the right to do this, and hence insures that their negotiating threat point is their full value, thus encouraging optimal investment. Of course, this situation means that the
vendor would capture all of the surplus in the absence of a contract, and the client would not invest producing quality code, thus reducing the total surplus.

This problem is solved by taking advantage of the fact that software can be costlessly duplicated. The vendor can then simply give a copy to the client, and through licensing rights can allow them to use it internally, but not sell it. This works, because the value derived by the client comes from the ability to use it internally. In general, the client has no ambition to sell the software, but only desires the unrestricted use of the software. Thus, the client’s threat point with a contractually stipulated irrevocable, paid-up license is the full value of its surplus, which causes the client to invest optimally.

This is exactly the obvious solution to the incomplete contracting problem. Assign the value each agent generates to that agent. However, this is never proposed as a solution because it relies on the rather peculiar property that software can be duplicated without cost. With a physical asset such as a drill press, one agent’s use of the asset excludes the other agent from using it. However, with software, the agents can simply make two copies, so that it can simultaneously be productive for both agents.

**POACHING**

The idea of *poaching* (Clemons and Hitt 2000) suggest that vendors may use the information gleaned from the outsourcing relationship in some form outside of the bounds of the contractual relationship. In it’s grossest form this would amount to the vendor selling services based on this information to other clients. This is a new idea in the IS literature which bares some examination. However, because of the newness it is not entirely clear what incentives arise from poaching. On the one hand, it seems reasonable that given that the vendor knows it can poach the ideas, there would be greater incentive for the vendor to invest in quality, because it could resell them for more if they were higher quality. Of course, this may in turn make the client underinvest. Further, there is information flow from vendor to client as well, and the client may be able to poach the vendor’s information. In general, one can assume that the vendor’s information is better than the client’s in the domain in question. Otherwise, the client would not be likely to outsource. At a more global level it seems that poaching (by the vendor) is bad for the client because the client can no longer derive monopoly profits from the information, and it would be bad for joint surplus for the same reason. However, contracts do not seem to recognize this danger. Consider what RETAIL has to say.

This Agreement shall not preclude either Party from developing materials or providing services which are competitive with the Materials irrespective of their similarity to computer programming code, documentation or other materials or services which might be delivered pursuant to this Agreement, except to the extent any of the same may infringe any of the other Party’s patent rights or copyrights.

Nothing contained in this Agreement shall restrict either Party from the use of any ideas, concepts, know-how, or techniques relating to data processing or network management which either Party, individually or jointly, develops or discloses under this Agreement, except to the extent such use infringes any of either Party’s patent rights or copyrights.

This seems to be saying that not only are firms aware of the poaching problem, but that it is acceptable. This seems counter intuitive, but at least two reasons present themselves. First, it may be the case that the vendor’s investment is so important that the client allows poaching to encourage maximal investment. This may very well be the case in fast moving industries, where
the ability to have an innovation earlier than competitors provides great revenue. The client may believe that by the time the vendor is able to implement the new innovation in rival firms, the value may already be gone (Josefek and Kauffman 1997).

This does not seem like a very satisfactory answer for a retail store, though. Perhaps a better, second, explanation is that firms are aware that these items are not truly verifiable by an outside party (i.e. the courts). In this case it may be better to expressly allow poaching than to risk expensive litigation. This would amount to the third type of contractual mechanism that modifies the outcomes of the game. In this case expressly allowing poaching increases the non-cooperative payoff to zero, where it would otherwise be the (very high) cost of an expensive court battle, which would end up with the same result. This would tend to give each firm a larger share of its own investment by raising the threat points, and this move firms closer to the optimal. These assumptions of no verifiability accord well with Clemons and Hitt (2000), and the idea that firms would purposefully implement a non-optimal scheme is supported by Heide and John (Heide and John 1988). Further, as the contract notes, this protection does not extend to copyrights and patents, which presumably are verifiable by a court.

The TELECOM contract provides further support of this idea. As the contract is set up more as a partnership than a simple purchase of services, there is a greater level of information sharing between the two firms. As a result, there is a greater need for protection. Additionally, telecommunications is very IT intensive, and it is more likely that the TELECOM firm will actually have IT knowledge of great value. Finally, a large IT vendor is likely to have a relatively well established telecommunications infrastructure, especially high bandwidth lines linking data centers. The vendor is likely to be in a good position to sell these services to other vendors or data centers, which could result in direct competition between TELECOM and its vendor in the future. At least it is much more likely that an IT outsourcing vendor will enter the telecommunication business than it is that they will open a retail store or a steel mill. All of these facts suggest that poaching would be more of a problem in the TELECOM relationship than in the RETAIL relationship, and the contract reflects this.

Nothing in this Agreement … shall restrict employees or representatives of a Party who retain solely in intangible for after performing the obligations of such Party under this Agreement, general ideas, concepts, know-how, or techniques relating to data processing or network management which either Party, individually or jointly, develops or discloses to such employee or representative while such employee or representative is performing the obligations, or exercising the rights, of a Party under this Agreement, from using such ideas, concepts, know-how, or techniques for the benefit of either Party, except to the extent that such use infringes upon any patent or copyright of a Party or its Affiliates …; provided, however, that this Section …shall not be deemed to apply to: Client business or financial information; Client supplier information; Client customer lists; Client business or marketing plans; or proprietary information of an Client customer that is the subject of confidentiality obligations of an Client.

There are two important points to note about this sentence. One, the acid test for what constitutes poaching is stricter. The poached information must be in solely intangible form, whereas in the RETAIL contract one firm could put lines of uncopyrighted code onto a disk. Further, more things are prohibited from being poached, including business plans, customer lists, and other strategic information. While it is not clear exactly what firms should do to mitigate information poaching, it is clear that this is a very interesting topic worthy of further examination.
TRANSFERS DUE TO INFLATION IN IT OUTSOURCING CONTRACTS

Assurances can also be used to encourage investments in response to exogenously determined inflation. Basically, an inflation clause would guarantee that the minimum is the real minimum, rather than a nominal minimum. In concordance with the incomplete contract model, the contracts specified a cost of living allowance (COLA) to guarantee the minimum outcome. Of course, if inflation becomes considerably burdensome, the COLA adjustment might make the adjusted cost of services disproportionately high, thereby lowering the minimum outcome for the client. To compensate for this possibility, one contract went so far as to establish high COLA as reason for termination.

If the CPI-U … as reported by the Bureau of Labor Statistics, U.S. Department of Labor, at the end of an Contract Year, is more than seven percent (7%) greater than the CPI-U, as so reported, in effect immediately prior to such Contract Year and if, contemporaneous with the reporting of the CPI-U in effect at the end of such Contract Year, the interest rate on five year Treasury Bills is equal to or greater than ten percent (10%) per annum, Client may terminate this Agreement …

Two particulars about inflation are needed to better understand the reasoning being allowing the client the right to terminate the contract. The first is that IT prices will often lag inflation. This results from the continued consistency of Moore’s law, which means that processing power is actually subject to deflation, so that similar power will be much less costly in the future. Further, the IT function consumes very few physical resources. The actual hardware and software are long term durables, that are not actually used up in the creation of IT services. The only factor of IT production subject to inflation, in the short run, is labor. Thus, the second point is that inflation effects the factors of IT productivity differently. This means that inflation will tend to alter the optimal mix of inputs, which would, in turn, create the opportunity for surplus generation through contract renegotiation.

In sum, inflation tends to create the opportunity for generation of surplus by modifying the contract. However, in the absence of the above clause, the bargaining power all lies with the vendor, who can force the contract to continue. Thus, to encourage renegotiation, and hence the generation of greater surplus, the party adversely affected by inflation is given a greater threat point. Specifically, the client has the right to invoke the quintessential incomplete contract if inflation is greater than 7%.

From a modeling standpoint this is a very interesting clause, and it is not entirely clear how this would shape the investment incentives of the two firms. We might expect that the vendor’s incentives to invest would follow an inverted U shape with respect to inflation. As inflation increased slightly, the contract would be distorted in favor of the vendor, encouraging him to make more investment in anticipation of a greater share of the surplus. However, as inflation approached the 7% mark, the vendor would realize that the power might shift back in favor of the client, and thus it would cut back its investment. It would not be surprising to see the vendor initiate renegotiation proceedings near the peak of their power. Of course, the client’s payoff and investment would follow a U shape opposite to the vendor’s. The client would tend not to want to renegotiate at the low point of their power. This opens a fantastic opportunity to model

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Note that the surplus exists because a new contract that substituted relatively cheaper capital for relatively more expensive labor would be better than the current contract. This does not imply that firms are better off with inflation, and probably the opposite is true. What this does imply is that firms are better off changing contracts if inflation is high.
the optimal renegotiation time as a function of inflation, and might lead to multiple equilibriums. The potential importance of understanding this might be largely underestimated as the United States has not been subject to high inflation, since outsourcing emerged as a standard business practice.

RENEGOTIATION AND TRANSFERS RELATIVE TO COMMUNICATION IN IT OUTSOURCING CONTRACTS

Besides guaranteeing the minimum game outcome, a contract can be improved by reducing uncertainty. Moreover, increasing certainty earlier in the relationship will generally result in greater joint surplus than a similar increase in certainty later in the relationship. Thus, contracts can be expected to have clauses specifying communication between firms to help define each firm’s payoff structure for the other firm. For example, firms define a transition period during which services are migrated from the client to the vendor. The first part of this transition period requires the creation of a plan for how the transaction is to be handled, as described below.

There will be a 90 day period (the “Transition Period”) beginning on the commencement Data during which time Vendor shall migrate the Services performed by or on behalf of Client from Client to Vendor (the “Transition”). The Transition Period may be extended by mutual agreement of the Parties. The Parties have commenced and will complete, during the first 30 days of the Transition Period, a mutually agreed-upon written plan for the Transition (the “Transition Plan”) …

This passage illustrates several points. First, there will be contract renegotiation during the first 30 days, as the parties must mutually agree upon the transition plan. Next is the idea of communication between the parties in building a written plan. This is simply a method of communicating payoff structures between client and vendor. The contract could have easily specified that the client would follow the vendor’s instructions in the transition. Instead, what is observed is a subtler form of contractual control, which motivates both the client and the vendor to invest in creating the transition plan. The last point to note is that this communication occurs early in the relationship, thereby decreasing uncertainty over the life of the agreement.

Another communication tool that contracts specify is a representative from each company to keep communication flows open. Both the client and the vendor specify these individuals, and considerable control in the decision is given to both firms.

Yet another tool is a procedures manual, which is to be delivered from the vendor to the client soon after the contract commences. In fact the contracts explicitly recognize the fact that this manual may be difficult to create, but that delay is costly.

Within 90 days after the Commencement Date (the “Draft PM Data”), Vendor shall provide a draft manual (hardcopy or softcopy) describing the operating processes and procedures … Should Vendor fail to provide the draft Procedures Manual by the Draft PM Date or the final Procedures Manual by the final PM date, Vendor acknowledges that Client can be damaged by such failure.

…

If Vendor fails to deliver: (i) the draft Procedures Manual by the Draft PM Date; or (ii) the final Procedures Manual by the final PM date, Client will be entitled to a PM credit equal to Ten Thousand Dollars ($10,000) for each ninety (90) day period, until such time a Vendor delivers …
Notice that not only is the contract specifying that communication must occur, but it also explicitly changes the payoff of the game if the communication is late. Other communication tools laid out in the contracts include audits, and quarterly reviews.

Because the timing of the uncertainty reduction is important, with earlier being better, firms can use the contract negotiations themselves as a communication device. Thus, forming the contract is an investment in understanding one another’s payoff structure. A better formed contract would tend to lead to more investment, and to greater surplus from the relationship. In fact the first part of the contract is a specification of definitions of terms.

As Lee (1994) observes, “an interpretive account could serve the positivist researcher by suggesting what to add, delete, modify, replace, or otherwise include… (p. 148).” Certainly, the study of communication as an important aspect of not only contracting, but of IORs in general, can benefit from better modeling. There is no doubt that firms must communicate with each other in order to do business. In the context of the positivist model of this paper, the firms must communicate their payoff structures to one another. It is fundamentally problematic to take actions aimed at maximizing joint surplus, if the region of joint surplus is not known.

Communication adds massive complexity to the analysis of relationships, which are formed based on ideas communicated between firms, and the contracts, which may stipulate communication based on the quality of previous communication. Several authors have embarked on an effort to include communication in contracting. For example, (Banker, et al. 2000) develop a model that shows how IT can reduce contractual incompleteness by providing the parties with inexpensive information. While these efforts are laudable, they only begin to scratch the surface of the communication in contracting issue in IS.

OWNERSHIP OF TERMINATION IN IT OUTSOURCING CONTRACTS

Another example of the value of assurances occurs in the specification of how the termination of the agreement is to be handled. This is a very sensitive time for each firm, but particularly so for the client. At the extreme the vendor could simply pull the plug on the whole operation, leaving the client without IT capabilities for a considerable length of time. This would represent a particularly bad non-cooperative outcome, and would tend to reduce the incentive of the client to invest in the relationship. Thus, contracts can be expected to detail a number of safeguards that increase the value of the non-cooperative game. In fact, contracts were found to have exactly such safeguards. For example the following passage describes the termination the relationship, and a similar clause was found in all contracts.

It is the intent of the Parties that at the expiration or termination of the Agreement, Vendor will cooperate with Client to assist with the orderly transfer of the Services provided by Vendor hereunder to another services provider or Client itself. Prior to expiration or termination of the Agreement, Client may request Vendor to perform and, if so requested Vendor shall perform services in connection with migrating the work of Client to another services provider or Client itself …

Clearly, without such a clause the client firm would be completely at the mercy of the vendor firm at the end of the contract cycle. The threat point for the client would be nil, and they would have no incentive to invest in the relationship. The likely course of events is that the client would be willing to make investments early in the relationship, when they would be guaranteed the longest return of those investments. However, as the termination date drew nearer, the client
would stop investing in improvements, as it realized that the vendor would actually charge is more for the innovations. This would lower the overall quality of the system, and reduce joint surplus. Instead, the parties agree in advance that services developed late in the relationship would not be used against the client, and thus the client makes more investment. This increase in the joint surplus is paid for by a transfer from the client to the vendor. Clearly, the vendor would be willing to offer the contract at a lower price, if it were given the right to hold the client up at the termination.

DISCUSSION

CONTRIBUTION

This work makes a number of valuable contributions to the IS literature. It develops mid range theory of how firms use contracts to solve the problems inherent in IT outsourcing. Specifically, it details how firms can offer one another assurances to guarantee return on investment. By offering a firm a return on its investment beyond what it would get in the absence of a contract, the contract encourages greater levels of investment and hence greater joint surplus. Furthermore, this work operationalizes the idea of assurances to the context of IT outsourcing, explaining specific aspects of IT outsourcing and proposing assurance based solutions to those problems. Finally, this work assesses the reasonableness of those operationalizations by examining the text of real world contracts.

A forth contribution of this work lies in taking a close look at the actual text of real contracts. By showing the IS community the text of contracts, rather than just a model of what they can do, this work should provide the impetus for new thinking about outsourcing and IOR’s in general. Analysis of the presented text has been left purposefully open in hopes that future researchers will be stimulated to think through new theory to help explain IS contracting.

DIRECTIONS FOR FUTURE RESEARCH

Many directions for future research present themselves as a result of this analysis. Generally, these can be categorized as operational and economic. The operational research questions are touched on briefly in some of the analysis above. For example, the impact of IT on the ability to contract, measure and monitor certainly will prove to be an interesting an valuable avenue for inquiry. Researchers should develop an explanation of how IT not only may allow firms to write better contracts, but also how contracts can be written to take advantage of some of the special properties of IT such a costless reproduction of software. Decision support for outsourcing contracts would be an invaluable addition to the ability of firms to use IT for to generate value. It seems that none are more qualified to develop such support than the IS community. At the same time, the legal nuances of contracting would require the cooperation of legal scholars, paving the way for more interdisciplinary research.

Another important operational research area concerns itself with digital contracting. There is no a priori reason why contracts must be static documents. Rather than being static documents, contracts could be dynamic intelligent systems that constantly updated the parameters in response to changes in the external environment. In the example of the inflation clause we see how a static document has difficult offering assurances in response to a changing environment. A digital contract could have the capabilities of smoothing the impacts of inflation by tapping directly into the accounting system of each firm, and rather than measuring some national
inflation rate, measure the inflation rate of the relationship, and automatically compensate each firm appropriately.

On the economic front several extensions of the modeling assumptions remain to be examined. One highly successful explanation of IORs comes from transaction cost economics (Coase 1937, Williamson 1975, Williamson 1985). The underlying assumptions of this model are bounded rationality and opportunism (Williamson 1985). This analysis makes neither one of those assumptions. Opportunism is self interest seeking with guile, which is different from simple self interest seeking as assumed in this analysis. Opportunism suggests that agents will mislead, cajole and deceive to improve their own positions. Certainly, this behavior is always present when contracts are negotiated. This work mitigates the problems of opportunism to some degree by choosing to look at relationships with a reputable vendor, that has refrained from excessive opportunism in the past, and has the reputation incentives to continue to exercise such restraint. However, opportunism is a good assumption that should be addressed in future research. Similarly, this analysis has assumed complete rationality, while bounded rationality may be a better assumption.

While this work has focused on property rights, this theory is only one of a variety of ways to offer assurances. Other methods might include, dependence balancing, reputation, trust, and messaging. In all likelihood no one theory can explain all of the text in contracts and future research should address the degree to which different theories explain contracts. More importantly, future research should address the boundary conditions to explain the circumstances that make firms choose one theory over an other and the outcomes of those choices.

CONCLUSION

In this work, I have presented a model of outsourcing contracts based on the behavioral assumptions of incomplete contract theory. Using interpretive methods I have examined the actual text of the contracts in question and found that they make sense from the perspective of the model. It should not be construed that this method could falsify the model, only a positivist test could do that. However, the goal was simply to see if the information in the contracts could be used to construct a story that made sense in terms of the model. If the story so constructed does in fact seem reasonable to the reader, then I have provided some support for the model. It is important to note that incomplete contract theory is known to be statistically intractable. The difficulty arises because the dependent variable is the unique surplus from a relationship and the independent variable is the importance of each parties investment. Importance is difficult to measure, and the only paper of which this author is aware that attempts to do so is (Saussier 1998), which asks managers to estimate how bad a failure on the part the partner firm would be.

Outsourcing and IORs will continue to grow in importance in the coming years as firms seek new ways to generate value. The contract is the defining document of these relationships. Understanding how it is created, and how it should be created proffers a remarkable opportunity for IS researchers and practitioners to help firms be more successful. This work is a beginning step in helping to develop a comprehensive theory of the why and how of IT contracting, and it is my great hope that it inspires a generation of researchers to scrutinize this question and continue the research.

REFERENCES


